

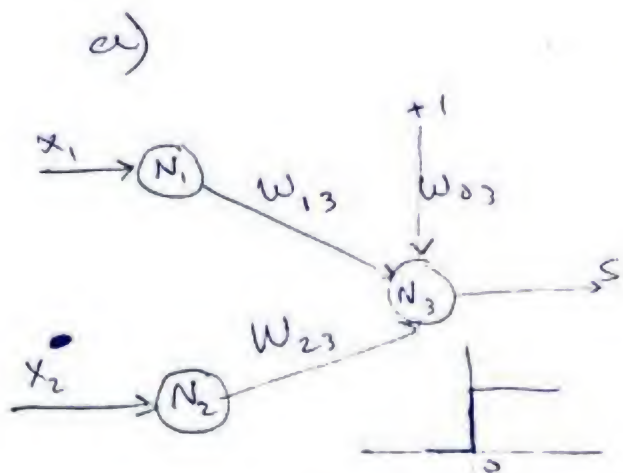
Sec 6

Neural

7) Design  $x_1 + \hat{x}_2$ 

a) weights

b) eqn. of separation line

c)  $(0, 1)$ ,  $(1, 0)$ ,  $(1, 1)$ d)  $(0.5, 0.5)$ ,  $(0.5, 1.5)$ ,  $(0, -0.5)$ 

$x_1$	$x_2$	$\hat{x}_2$	$x_1 + \hat{x}_2$
0	0	1	1
0	1	0	0
1	0	1	1
1	1	0	1

$$y = w_{13}x_1 + w_{23}x_2 + w_{03}$$

1)  $x_1 = x_2 = 0$

$$y = w_{03} \quad s = 1 \rightarrow w_{03} \geq 0$$

2)  $x_1 = 0 \quad x_2 = 1$

$$y = w_{23} + w_{03}$$

$$s = 0$$

$$w_{23} + w_{03} < 0$$

□

$$3) X_1 = 1 \quad X_2 = 0$$

$$y = w_{13} + w_{03} > 0 \quad S = 1$$

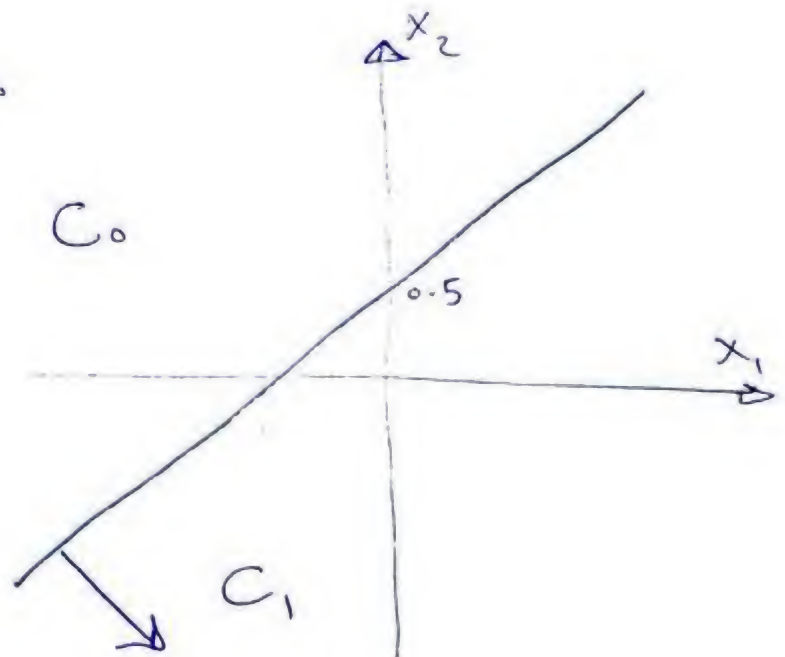
$$4) X_1 = 1 \quad X_2 = 1$$

$$y = w_{13} + w_{23} + w_{03} > 0 \quad S = 1$$

لنفترض قيم  $w_{03}$ ,  $w_{13}$ ,  $w_{23}$  بشرط ان تحقق الشروط

Let  $w_{03} = 0.5$ ,  $w_{13} = 1$ ,  $w_{23} = -1$

$$b) X_1 - X_2 + 0.5 = 0$$



$$c) (0, 1) \rightarrow C_0 \quad \& \quad (1, 0) \rightarrow C_1 \quad \& \quad (1, 1) \rightarrow C_1$$

له ممكن تصنيف بجدول.

$X_1, X_2$	$X_1 - X_2 + 0.5$	$S$	$C_0 / C_1$
$(0, 1)$	$-0.5 < 0$	0	$C_0$
$(0.5, 0.5)$	$0.5 > 0$	1	$C_1$
$(0, 0.5)$	$1 > 0$	1	$C_1$

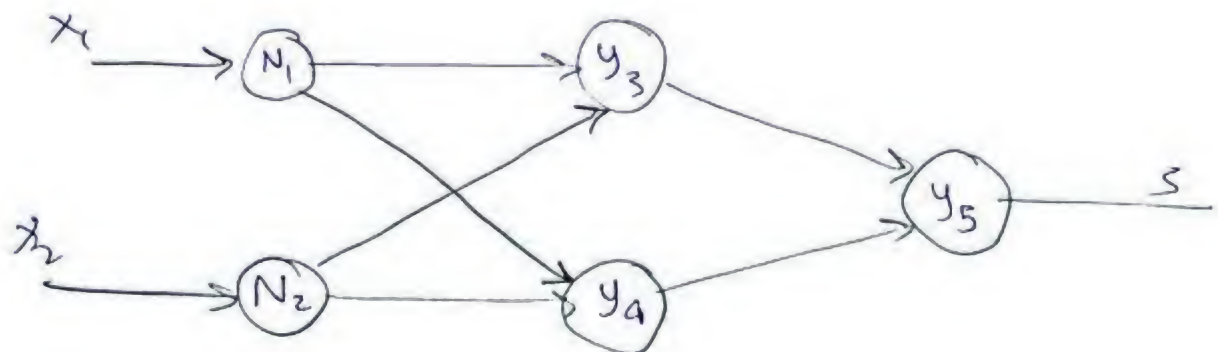
### 16) XNOR

a)  $w_{13} = 1$        $w_{23} = 1$        $w_{03} = -1.5$   
 $w_{14} = 1$        $w_{24} = -1$        $w_{04} = 0.5$   
 ~~$w_{35} = 1$~~        $w_{45} = 1$        $w_{05} = -0.5$

b) eqn.

c, d.  $((0, 0), (0, 1), (1, 1))$   
 $(1, -1) \quad (-1, 1)$   
 $(0.5, 0.7)$

binary threshold



$$y_3 \leq x_1 + x_2 - 1.5 \rightarrow \textcircled{1}$$

$$y_4 \leq -x_1 - x_2 + 0.5 \rightarrow \textcircled{2}$$

$$y_5 \leq f(y_4) + f(y_3) - 0.5$$

$x_1$	$x_2$	$y_3$	$f(y_3)$	$y_4$	$f(y_4)$	$y_5$	$s$	$C_0/C_1$
0	0	-1.5	0	0.5	1	0.5	1	$C_1$
0	1	-0.5	0	-0.5	0	-0.5	0	$C_0$
1	0	-0.5	0	-0.5	0	-0.5	0	$C_0$
1	1	0.5	1	-1.5	0	0.5	1	$C_1$

↓  
And

↓  
No R

↓  
OR

Solve  $\textcircled{1}$  ,  $\textcircled{2}$

